

Elements of Successful Implementation for Electronic Tools

A number of design features may improve the probability of successful implementation of transfusion guidelines as part of CDS for CPOE.^{54,57} Speed and a user-friendly interface are important. Minor changes in the appearance of an input screen can have a major impact on provider actions. The process should fit the user's workflow and provide clinically relevant information at the right time within that workflow.⁵¹ A recommended practice is to avoid "hard stops" in computerized orders, because these are strongly resisted by physicians and often lead physicians to develop work-arounds that circumvent CDS. Alerts with a hard stop should be reserved for situations that place patient safety at risk. Instead, the preferred actions should be made as easy as possible to execute, while decisions or actions that are discouraged should be made more difficult. The clinician should not be able to override critical alerts or barriers but should be allowed to easily exercise clinical judgment where appropriate. Changing a physician's direction is easier than stopping it.⁵⁴ For example, redirecting a physician to order vitamin K rather than plasma for

warfarin reversal without having to leave the transfusion order input screen will be more likely to achieve compliance with guidelines than a hard stop with no alternative or the need to initiate a new ordering process. Setting defaults to be consistent with guideline recommendations offers a path of least resistance and will improve compliance with guidelines. Finally, CPOE is most successful when its use is mandatory. With regard to blood component therapy, exceptions to mandatory use might include urgent or emergency requests for blood in an unstable patient with active bleeding.

Successful implementation of transfusion guidelines does not guarantee that initial changes in clinical practice will be durable. Tethering transfusion guidelines to CPOE facilitates transfusion utilization review and helps ensure compliance. CPOE allows the transfusion service to assign the ordering physician with great accuracy and avoids attribution of a transfused unit to an admitting or consulting physician who may have had no role in the transfusion decision. The indication for transfusion and relevant clinical data should also be captured electronically, facilitating statistical analysis of transfusion practice as well as utilization review.⁵⁸

CPOE Case Study: The Use of CPOE To Encourage Ordering RBCs as Single Units

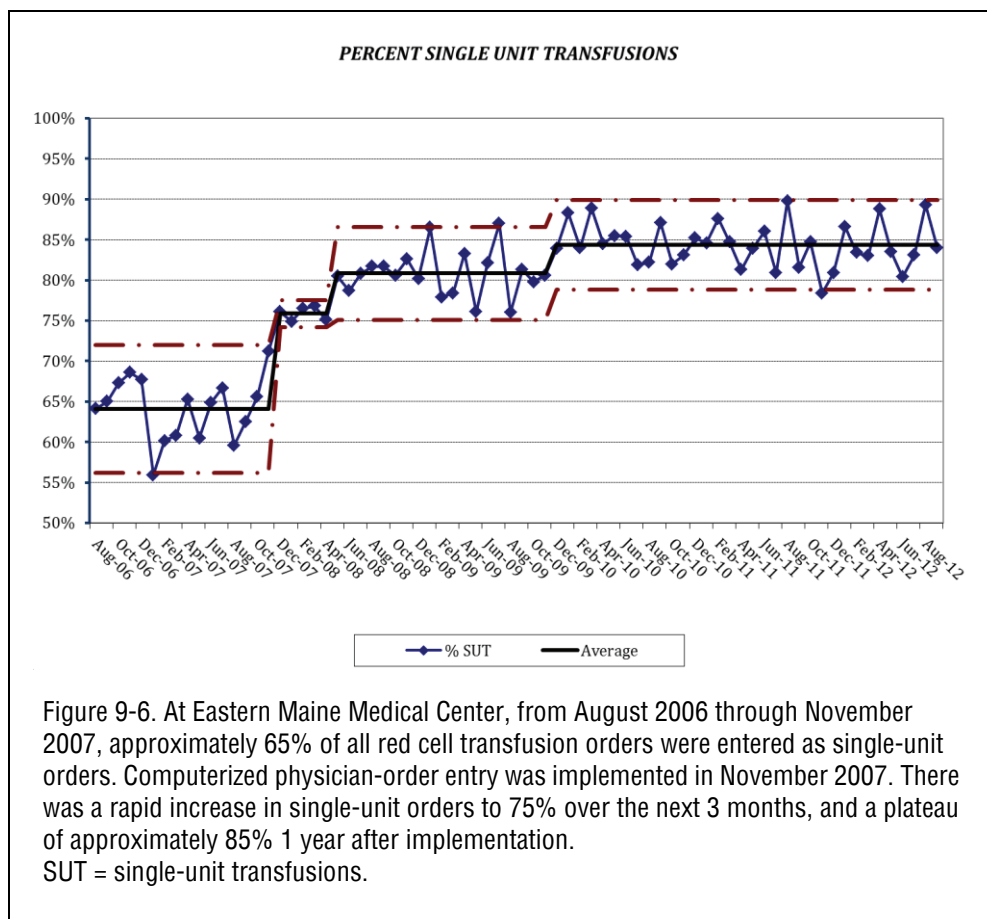
Eastern Maine Medical Center (EMMC) is a 375-bed tertiary hospital in Bangor, ME. EMMC implemented a comprehensive PBM program in 2007 and used CPOE with CDS as part of a transfusion guideline implementation strategy. One component of that strategy was to encourage single-unit RBC transfusions in stable, nonbleeding patients. Many physicians were taught informally that single-unit transfusions were likely to be ineffective, and some TCs have used single-unit RBC transfusions as a quality indicator prompting utilization review.⁵⁹ Based on the current risk/benefit profile of blood component therapy, there should be an emphasis on using the minimum effective dose, which is often a single unit in an otherwise stable patient who has dropped below a transfusion threshold.

EMMC decided that for most patients without significant active bleeding, the appropriate RBC order should be for a single unit, with clinical reassessment before a second unit is ordered. This was promoted through education and hospital policy as established by hospital transfusion guidelines. A significant level of success was achieved by this educational effort, with approximately 60% to 65% of all RBC orders being entered as

single-unit orders from August 2006 through November 2007 (Fig 9-6.)

In an effort to improve compliance, a CPOE process was designed that introduced a barrier to multiunit orders. Specifically, the process required the ordering physician to indicate whether the patient had active bleeding. If the patient was not actively bleeding, the transfusion ordering “conversation” within the CDS allowed only 1 unit to be ordered. To order a second unit, the physician needed to begin a new order “conversation.” This then required additional effort to go through the order process a second time, making it harder to do “the wrong thing.” As seen in Fig 9-6, after implementation of the CPOE process in November 2007, there was a rapid and sustainable increase in the percentage of RBC orders entered as single-unit orders, to approximately 85%. Further, quality monitoring showed that in patients transfused with only 1 unit, a second unit was ordered within the next 24 hours only 9% of the time (data not shown).

In conclusion, CPOE with CDS is a useful tool when combined with other behavioral interventions to reduce transfusions and assist in the implementation of transfusion guidelines. It may be difficult to discern the independent effect of any one intervention, but in combination these behavioral interventions



may have a significant effect on reducing transfusion rates.⁶⁰ CPOE has been shown to improve compliance even when transfusion guidelines are well-established, being accompanied by a significant reduction in transfusions given.²⁷ In addition, CPOE also improves the ease, accuracy, and timeliness of the utilization review process. Data from the computer orders can be collected and reviewed regularly by the TC with the goal of identifying physicians that regularly order against the guidelines, providing

the opportunity for feedback and education.

Summary

Faced with a tenuous blood supply and increasing blood costs, hospitals should work toward altering blood demand by promoting best practices for blood utilization and by the more efficient management of patients at high risk of transfusion. TCs are vital to PBM efforts in